

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

|  |  |  |
|--|--|--|
| Applicant's or agent's file reference<br><b>ILLINC.129VP</b> | <b>FOR FURTHER ACTION</b><br>see Form PCT/ISA/220<br>as well as, where applicable, item 5 below. |  |
| International application No.<br><b>PCT/US2009/044260</b>    | International filing date (day/month/year)<br><b>15/05/2009</b>                                  | (Earliest) Priority Date (day/month/year)<br><b>15/05/2008</b> |
| Applicant<br><b>ILLUMINA, INC.</b>                           |  |  |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 6 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed  
☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☒ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (see Box No III)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant  
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant  
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 2  
☒ as suggested by the applicant  
☐ as selected by this Authority, because the applicant failed to suggest a figure  
☐ as selected by this Authority, because this figure better characterizes the invention  
b. ☐ none of the figures is to be published with the abstract

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International application No.

PCT/US2009/044260

## Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, the international search was carried out on the basis of:
- a. type of material
- ☒ a sequence listing
- ☐ table(s) related to the sequence listing
- b. format of material
- ☒ on paper
- ☒ in electronic form
- c. time of filing/furnishing
- ☒ contained in the international application as filed
- ☒ filed together with the international application in electronic form
- ☐ furnished subsequently to this Authority for the purpose of search
2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
3. Additional comments:

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## A. CLASSIFICATION OF SUBJECT MATTER

INV. C12N9/02 C12Q1/66 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C12N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, CHEM ABS Data, FSTA, Sequence Search

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.  |
|-----------|--|--|
| X         | THOMPSON J F ET AL: "Mutation of a protease-sensitive region in firefly luciferase alters light emission properties."<br>THE JOURNAL OF BIOLOGICAL CHEMISTRY 25 JUL 1997,<br>vol. 272, no. 30,<br>25 July 1997 (1997-07-25), pages<br>18766-18771, XP002536073<br>ISSN: 0021-9258<br>page 18767 - page 18769 | 1,2,<br>4-10,20,<br>21,24,<br>25,<br>27-33,<br>43,44,<br>47,48 |
| Y         |  | 11-19,<br>22,23,<br>34-41,<br>45,46,<br>49-52                  |
|           | -----<br>-/--  |  |

☒

Further documents are listed in the continuation of Box C.

☒

See patent family annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the international search

9 July 2009

Date of mailing of the international search report

22/07/2009

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040,  
Fax: (+31-70) 340-3016

Authorized officer

Deleu, Laurent

International application No  
PCT/US2009/044260

| Category* | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.  |
|-----------|--|--|
| X         | <p>BRANCHINI B R ET AL: "Site-directed mutagenesis of histidine 245 in firefly luciferase: A proposed model of the active site"</p> <p>BIOCHEMISTRY, AMERICAN CHEMICAL SOCIETY, EASTON, PA.; US, vol. 37, no. 44, 1 January 1998 (1998-01-01), pages 15311-15319, XP003002918<br/>ISSN: 0006-2960<br/>page 15313; figure 3</p> | <p>1,4-6,9,<br/>10,20,<br/>21,24,<br/>27-29,<br/>32,33,<br/>43,44,<br/>47,48</p> |
| X         | <p>WO 2007/086935 A (454 LIFE SCIENCES CORP [US]; MCDADE KEITH E [US]; FIERRO JOSEPH M [US]) 2 August 2007 (2007-08-02)<br/>figures 1,12-21; example 28</p>  | <p>76-91</p>   |
| Y         |  | <p>15-19,<br/>22,23,<br/>38-41,<br/>45,46,<br/>49-52</p>                         |
| Y         | <p>TISI L C ET AL: "Development of a thermostable firefly luciferase"</p> <p>ANALYTICA CHIMICA ACTA, ELSEVIER, AMSTERDAM, NL, vol. 457, no. 1, 15 April 2002 (2002-04-15), pages 115-123, XP002424745<br/>ISSN: 0003-2670<br/>pages 117,121 - page 122; figure 1</p>   | <p>11-14,<br/>34-37</p>  |
| Y         | <p>WO 00/24878 A (SECR DEFENCE [GB]; SQUIRRELL DAVID JAMES [GB]; MURPHY MELENIE JANE [GB]) 4 May 2000 (2000-05-04)<br/>claims 1-30</p>   | <p>11-14,<br/>34-37</p>  |
| Y         | <p>BRANCHINI BRUCE R ET AL: "A mutagenesis study of the putative luciferin binding site residues of firefly luciferase."</p> <p>BIOCHEMISTRY, vol. 42, no. 35, 9 September 2003 (2003-09-09), pages 10429-10436, XP002536077<br/>ISSN: 0006-2960<br/>page 10433, right-hand column; figures 2,3; tables 1,2</p>                | <p>49-52</p>   |

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## C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.  |
|-----------|--|--|
| A         | <p>CONTI E ET AL: "CRYSTAL STRUCTURE OF FIREFLY LUCIFERASE THROWS LIGHT ON A SUPERFAMILY OF ADENYLATE-FORMING ENZYMES" STRUCTURE, CURRENT BIOLOGY LTD., PHILADELPHIA, PA, US, vol. 4, no. 3, 15 March 1996 (1996-03-15), pages 287-298, XP001062127<br/>ISSN: 0969-2126<br/>cited in the application<br/>figures 7,8</p> |  |
| P,X       | <p>US 2009/081680 A1 (TSUNODA HIROYUKI [JP] ET AL) 26 March 2009 (2009-03-26)</p> <p>figures 2,3; example 2</p>  | <p>1,2,4-6,<br/>20,21,<br/>24,25,<br/>27-29,<br/>43,<br/>47-50,52</p>                          |
| E         | <p>WO 2009/066673 A (KIKKOMAN CORP [JP]; SUZUKI SHIGEYA; KODAMA YUKAKO; KUROSAWA KEIKO; KOB) 28 May 2009 (2009-05-28)</p> <p>page 16; figure 1</p>   | <p>1,2,4,6,<br/>20,21,<br/>24,25,<br/>27,29,<br/>43,44,<br/>47-50,<br/>55-60,<br/>62,74,75</p> |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|---|----|---------------------|----------------------------|---------------------|
| WO 2007086935                             | A  | 02-08-2007          | CA 2616762 A1              | 02-08-2007          |
|   |    |                     | CN 101278295 A             | 01-10-2008          |
|   |    |                     | EP 1922664 A2              | 21-05-2008          |
|   |    |                     | JP 2009502202 T            | 29-01-2009          |
|   |    |                     | US 2006040297 A1           | 23-02-2006          |
| WO 0024878                                | A  | 04-05-2000          | AT 418602 T                | 15-01-2009          |
|   |    |                     | AT 419335 T                | 15-01-2009          |
|   |    |                     | AU 770722 B2               | 26-02-2004          |
|   |    |                     | AU 2004200277 A1           | 19-02-2004          |
|   |    |                     | AU 2004202276 A1           | 17-06-2004          |
|   |    |                     | AU 2004202277 A1           | 17-06-2004          |
|   |    |                     | AU 2008203449 A1           | 28-08-2008          |
|   |    |                     | CA 2342300 A1              | 04-05-2000          |
|   |    |                     | DK 1479763 T3              | 06-04-2009          |
|   |    |                     | DK 1124944 T3              | 14-04-2009          |
|   |    |                     | EP 1479763 A2              | 24-11-2004          |
|   |    |                     | EP 2071023 A2              | 17-06-2009          |
|   |    |                     | EP 1124944 A2              | 22-08-2001          |
|   |    |                     | ES 2319520 T3              | 08-05-2009          |
|   |    |                     | ES 2319941 T3              | 14-05-2009          |
|   |    |                     | GB 2345913 A               | 26-07-2000          |
|   |    |                     | JP 2003518912 T            | 17-06-2003          |
| US 2009081680                             | A1 | 26-03-2009          | CN 101397550 A             | 01-04-2009          |
|   |    |                     | JP 2009077660 A            | 16-04-2009          |
| WO 2009066673                             | A  | 28-05-2009          | NONE                       |                     |